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# Title Page

## Content Analysis of Patient Safety Incident Reports for Older Adult Patient Transfers, Handovers and Discharges: Do they Serve Organisations, Staff or Patients?

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35 **ABSTRACT**

36

37 **Objectives:** Analyse content of incident reports during patient transitions in the context of care of  
38 older people, cardiology, orthopaedics and stroke.

39

40 **Methods:** A structured search strategy identified incident reports involving patient transitions  
41 (March 2014 – August 2014, January 2015 – June 2015) within two NHS Trusts (in upper and  
42 lower quartiles of incident reports/100 admissions) in care of older people, cardiology, orthopaedics  
43 and stroke. Content analysis identified: incident classifications; active failures; latent conditions;  
44 patient/relative involvement; and evidence of individual or organisational learning. Reported harm  
45 was interpreted with reference to National Reporting and Learning System criteria.

46

47 **Results:** A total 278 incident reports were analysed. Fourteen incident classifications were  
48 identified, with pressure ulcers the modal category (n=101; 36%) followed by falls (n=32, 12%),  
49 medication (n=31, 11%) and documentation (n=29, 10%). Half (n=139; 50%) of incident reports  
50 related to inter-unit/department/team transfers. Latent conditions were explicit in 33 (12%) reports;  
51 most frequently, these related to inadequate resources/staff and concomitant time pressures (n=13).  
52 Patient/family involvement was explicit in 61 (22%) reports. Patient well-being was explicit in 24  
53 (9%) reports. Individual and organisational learning was evident in 3% and 7% of reports  
54 respectively. Reported harm was significantly lower than coder-interpreted harm (p<0.0001).

55

56 **Conclusions:** Incident report quality was sub-optimal for individual and organisational learning.  
57 Under-reporting level of harm suggests reporter bias, which requires reducing as much as  
58 practicable. System-level interventions are warranted to encourage use of staff reflective skills,  
59 emphasising joint ownership of incidents. Co-producing incident reports with other clinicians  
60 involved in the transition and patients/relatives could optimise organisational learning.

61

## 62 INTRODUCTION

63 Patient safety incident reporting by healthcare professionals is an established process across many  
64 healthcare systems internationally. Clinician incident reports can impact positively on patient safety  
65 by driving changes in care processes and changing knowledge and attitudes.[1] Reporting of safety  
66 incidents is a key component of a systems approach to safety; however, it has been identified that  
67 clinicians tend to 'fix and forget' when they encounter a safety problem, rather than 'fix and report',  
68 which hampers the ability for organisational learning.[2] Similarly, a systematic review of the  
69 effectiveness of incident reporting systems found that out of 35 studies, none suitably demonstrated  
70 the double-loop learning required for changes to governance that would result in system learning.[3]  
71 Other well-recognised barriers to incident reporting and subsequent learning include perceived time  
72 constraints;[4 5] professional responsibilities;[5 6] lack of involvement in the system of reporting  
73 errors and rejection of bureaucracy;[7] incomplete feedback loops;[4 5] the inevitability of error[7];  
74 and perceived seriousness of incidents.[5] Whilst avoidance of blame is an additional barrier to  
75 incident reporting,[4 7] it has also been identified that incident reports can be used to apportion  
76 blame to others.[8 9]

77

78 It is recognised that incident reports alone are not an adequate measure of safety,[10] but that they  
79 should be used as an indicator for further investigation.[11 12] In turn this creates a requirement for  
80 higher quality incident reports, rather than an increased quantity that is indicative of a more positive  
81 safety culture.[13] Analyses of the content of incident reports have been relatively few and far  
82 between in the literature, despite the prevalence of incident reporting across healthcare systems.  
83 Existing analyses have tended to be descriptive, based on a single incident classification such as  
84 medication errors,[14-17] falls[18] or pressure ulcers.[19] Other studies have investigated incident  
85 reports related to patient outcomes, such as patient mortality,[20] and specific clinical areas, such as  
86 anaesthesia[21 22] or the emergency department.[23] Incident reports relating to clinical handovers  
87 have also been studied in detail in one identified study,[24] with poor, incomplete or no handover  
88 representing 74% of 334 analysed reports, and 99% of reports being assigned a rating of low harm.  
89 Notably, none of these studies reported whether, or how, the incidents were disclosed to patients.  
90 Involving patients and their families, even when limited to only incident disclosure, has been  
91 reported to have the ability to improve patient-provider relationships.[25] Moreover, disclosure of  
92 incidents is now required in the UK National Health Service (NHS) as part of a clinician's duty of  
93 candour where incidents lead to death, or are deemed to be of severe harm, moderate harm, or  
94 prolonged psychological harm.[26]

95

96 The aim of this paper was to elucidate what clinician incident reports tell us about patient safety  
97 incidents during transfers, handovers and discharges (collectively referred to transitions) in the  
98 clinical contexts of care of older people, cardiology, orthopaedics and stroke. Specifically we aimed  
99 to identify types of transitions and theoretical constructs of safety models (active failures and latent  
100 conditions[27]) to inform changes to practice. This included the extent of individual and  
101 organisational learning, the degree of patient and family member involvement in safety incidents,  
102 and the extent that reported harm was deemed congruent with established criteria for categorisation  
103 of harm.

104

## 105 **METHODS**

106 Ethical approval for the collection and analysis of incident reports for the included NHS Trusts and  
107 wards was obtained from the Yorkshire and The Humber/Leeds West NHS Ethics Committee  
108 (13/YH/0372) as part of the PROSOCT study.[28] R&D approval for access and use of data was  
109 provided by the individual NHS Trusts. Incident reports were anonymised by participating Trusts as  
110 part of the research governance process.

111

### 112 **Sampling frame and search strategy**

113 A structured search strategy identified all incident reports involving patient transitions during  
114 March 2014 to August 2014 and January 2015 to June 2015 from four hospitals within two NHS  
115 Trusts in 16 wards representing four clinical areas: care of older people; cardiology; orthopaedics;  
116 and stroke. Incident reports relating to transfers, handovers and discharges were identified based on  
117 pre-existing categories; 'failure/delay of discharge' and 'admission/transfer problems'. This was  
118 supplemented by a keyword search of incident reports consisting of 'discharge', 'transfer',  
119 'handover' or 'hand-off'. The trusts represented the upper and lower quartiles of all NHS Trusts in  
120 England based on the number of incident reports per 100 admissions. One of the Trusts had 7  
121 reports per 100 admissions; whereas the second had 3 reports per 100 admissions.

122

123 Anonymised incident reports retrieved from the search strategy were transferred to an Excel sheet  
124 with the following data fields: anonymous ID number, incident description; action(s) taken,  
125 category, degree of reported harm, and clinical area (derived from hospital ward name). Root cause  
126 analyses of the incident reports were not available.

127

### 128 **Eligibility criteria**

129 Eligible incident reports had to explicitly describe any type of care process (collect, assess, plan,  
130 supplement or follow-up/monitor or evaluation[29]) as part of a patient transition (completed or

131 planned). A transition was defined as the movement of a patient from one location to another, which  
132 also included self-transfer (or self-discharge) by the patient. Incidents were excluded where there  
133 was no indication of a safety incident associated with a patient transition, such as an unwitnessed  
134 fall or incident reports focused on concerns about staffing levels.

135

### 136 **Data extraction and analysis**

137 A researcher (JS) became familiar with the data by reading a large proportion of the safety incidents  
138 and becoming immersed in the data, as part of the preparation phase for content analysis.[30] A data  
139 extraction form (online appendix 1) and accompanying coding manual (online appendix 2) were  
140 then developed to enhance the reliability of the data extraction and analysis process. Data extraction  
141 and coding was based on data explicitly reported in the incident report (otherwise a code of 'none'  
142 was recorded).

143

144 The data extraction form was piloted; JS individually coded 20% of incidents, which were also  
145 independently coded by AB, ADB, EH, PD (5% each). Following the pilot, the extracted data  
146 were compared and discussed by the coders, with a particular emphasis on (dis)agreements and  
147 partial (dis)agreements. Inter-rater reliability was measured using percentage agreement and  
148 Scott's Pi. As a result of these discussions, the data extraction form was revised to improve  
149 clarity and meaning for all variables. Data extraction was then piloted on 20 randomly selected  
150 incident reports by two coders (JS and DF) working independently, with percentage agreement of  
151 >90%. Further refinements were then made to the data extraction form and coding manual. Inter-  
152 rater reliability testing results are available in online appendix 3. The final data extraction form  
153 captured the following variables:

- 154 • Type of transition (informed by definitions developed by Pezzolesi and colleagues)[24]
- 155 • Reason for transition
- 156 • Incident classification
- 157 • Active failures[30]
- 158 • Latent conditions[30]
- 159 • Staff actions
- 160 • Role of reporter in incident
- 161 • Patient/family involvement
- 162 • Patient well-being
- 163 • Evidence of individual learning
- 164 • Evidence of organisational/systems learning

- Concordance between level of harm reported in the incident and the coder's interpretation (based on National Reporting and Learning System (NRLS) definitions of harm[31]
- Coder's reflections on the incident

DF then coded the remaining incident reports, with any case reports identified as ineligible confirmed by a second coder (JS).

Microsoft Excel was used to file and code qualitative data. Initial coding of incident classification, active failures, latent conditions and free text responses of the coder's reflections on specific incident classifications were content analysed for manifest content.[30] Each incident report was treated as a single unit of data due to a tendency for the individual completing the incident report to conflate the two types of data, thus producing a single account.

IBM SPSS Statistics version 24 was used to generate appropriate descriptive statistics for all variables, including conducting a Chi-square test to establish associations between observed levels of harm and interpreted harm within incident reports.

## RESULTS

A total of 375 incident reports were identified by the search strategy. Ninety seven were excluded for reasons such as not being related to a patient safety related transition (online appendix 4), with 278 included in the analyses (Figure 1). This meant that 2.5% of the 11,282 patient discharges during the study period had an incident report that met the inclusion criteria.

**[Insert figure 1 around here]**

Fourteen incident classifications were identified across the dataset overall (Table 1). The modal incident classification was pressure ulcers (n=101, 36%), followed (in descending frequency) by falls (n=32, 12%); medication (n=31, 11%); documentation (n=29, 10%); delayed transition (n=15, 5%); communication (n=15, 5%); device / equipment (n=12, 4%); infection control (n=11, 4%); potentially unsafe transition (n=11, 4%); patient self-transfer (n=10, 4%); staff related issues (n=4, 2%); sub-optimal treatment (n=4, 2%); patient injury, (n=2, 1%); and patient violence (n=1, <1%).

Pressure ulcers was the dominant incident classification across all four clinical areas, followed by medication (care of older people and cardiology), documentation (orthopaedics) and falls (stroke) (online appendix 5). Table 2 shows the cross-tabulation of incident classifications with active

failures, including exemplar quotes from actual incident reports. Incidents related to medication had the greatest number of unique active failures (n=11), with the number of active failures broadly equating to frequency of incident classifications.

**[Insert tables 1 and 2 around here]**

Table 1 shows the summary statistics for a cross tabulation of type of transition and incident classifications (and codes) for the dataset overall. Half of all incident reports were inter-unit/department/team transfers (n=139, 50%), followed (in descending frequency) by discharges/out of hospital transfers; intra-unit/department/team transfers; and hospital to hospital transfers (Table 1).

The rank order of the three most frequently reported transition types for the dataset overall was identical for the care of older people, cardiology and orthopaedics (inter-unit/dept/team, out of hospital, intra-unit/dept/team). For incidents from stroke care, inter-unit/dept/team transitions were more frequently reported, and intra-unit/department/team and out of hospital were ranked 2<sup>nd</sup> and 3<sup>rd</sup> respectively (online appendix 6). The transition type ‘Into hospital’ was present in reports from three of the four clinical specialisms - care of older people, cardiology and orthopaedics. Patient self-transfers were only reported for two clinical specialisms - cardiology and orthopaedics. In one incident report for orthopaedics the transition type was unknown.

**Latent conditions, patient/family involvement, patient well-being and learning**

A cross-tabulation of incident classifications with latent conditions, patient/family involvement, patient well-being and learning is presented in Table 3.

Information pertaining to nine different latent conditions was present in 33/278 (12%) of incident reports: inadequate resources/staff and related time pressures (n=13); pressures for bed space (n=6); competing demands of wards (n=3); staff unaware of policy/procedures (n=3); staff inexperience (n=2); local policy/workflow procedures (n=2); inadequate equipment (n=1); ward design (n=2); and over-ruled by management (n=1). Incident classifications with the highest proportion (percentage) of explicit references to latent conditions were staff-related issues, delayed transition and infection control.

Patient or family involvement was identified in 61/278 (22%) incident reports; although this was typically superficial and passive, such as ‘*patient or family member informed or given advice*’. The



235 incident classifications with the highest proportion of explicit references to patient or family  
236 involvement were staff-related issues, patient self-transfers and delayed transitions. Evidence of  
237 directly addressing patient well-being was identified in 24/278 (9%) reports (primarily for  
238 medication errors and staff-related issues that prevented timely provision of care), with statements  
239 such as *‘apology given to patient or family member’*. The greatest proportion of incidents with  
240 evidence of addressing patient well-being was for staff-related issues (3/4 = 75%); for example a  
241 case involving an unexpected patient transfer (inter-unit/dept/team) in the care of older people,  
242 where the patient felt unsafe due to receiving staff being *‘very unwelcoming’* – *“Our member of*  
243 *staff stayed with the patient until a mattress had been found and tried to reassure her she would be*  
244 *safe on the ward”*

245

246 Individual learning was evident in only 7/278 (3%) incident reports. Nine (3%) incident reports  
247 made reference to organisational learning: discussed with staff/other senior team members (n=7);  
248 and root cause analysis (n=2). Only one incident report included explicit evidence of double-loop  
249 learning (both individual and organisational learning).

250

251 **[Insert table 3 around here]**

252

### 253 **Concordance between reported and interpreted harm**

254 A chi-square test indicated there was a significant difference between levels of harm reported within  
255 incident reports and the coder’s (DF) interpretation (Figure 2;  $\chi^2$  [9] = 216.5,  $p < 0.0001$ ). Overall,  
256 116/278 (42%) cases of reported harm were re-graded by the coder, with 114/116 (98%) of these  
257 being re-graded to a higher level of harm.

258

259 **[Insert figure 2 around here]**

260

261 Examples from incident reports that illustrate the discordance between observed and interpreted  
262 harm related to pressure ulcers; the following examples were designated as no harm:

263

264 *“Patient was admitted into hospital with a grade 3 pressure sore to her sacrum,*  
265 *onto [ward name] patient then transferred [sic] to [ward name] on [date] with a*  
266 *fractured hip” [Incident report 154]*

267

268 *“Found to have Cat 3 pressure ulcer on coccyx 2cm x1.5cm. Discharged home with*  
269 *pressure [sic] relieving equipment” [Incident report 339]*

270

## 271 **DISCUSSION**

272 The aim of this paper was to elucidate what clinician incident reports tell us about patient safety  
273 incidents during transitions in the clinical context of care of older people, cardiology, orthopaedics  
274 and stroke. The majority (69%) of incidents in our dataset related to pressure ulcers, falls,  
275 medication and documentation errors; these categories generally reflect studies that have  
276 investigated single incident classifications,[14-19] but no known study has previously observed the  
277 prevalence of these incidents in relation to transitions in care. Half (50%) of incidents involved  
278 inter-unit/department/team transfers, closely matching the 51% of incident reports previously  
279 identified in relation to patient handovers.[24] Aggregate level analyses revealed that the vast  
280 majority of incident reports involving patient transitions were of poor quality; they tended to focus  
281 on identifying the presence of an incident, and to a lesser extent explaining the contributory active  
282 failures. Only 12% made any explicit references to latent conditions that could help to elucidate the  
283 factors associated with the why and how, which are necessary to inform learning and design of  
284 preventative strategies. This low proportion of contributory factors has also been described in  
285 analyses of incident reports in the context of primary care.[33]

286

287 There was also paucity of explicit references to individual and organisation learning, with only one  
288 incident report containing evidence of double-loop learning needed to drive changes to governance  
289 that would result in system learning.[3] The dearth of individual and organisational learning is a  
290 particularly crucial finding as the importance of local learning has recently been recognised.[31]  
291 However our findings appear to suggest that incident reporters are either not utilising their reflective  
292 skills, or are reporting to apportion or deflect blame. For instance, staff may be adopting a ‘fix and  
293 forget’ as opposed to ‘fix and report’ philosophy,[6] which could moderate their motivation (and  
294 behaviour) to provide a more comprehensive incident report. Another explanation may be that staff  
295 or are using the incident reports for purposes other than learning. Building on previous work where  
296 culture was deemed to be a barrier to incident reporting,[4] analyses in the current study suggest  
297 that incident reports were primarily used as a vehicle to defend receiving staff and organisations by  
298 assigning responsibility to senders (out of hospital, hospital to hospital, inter-unit/department/team  
299 and into hospital) or to patients (intra-unit/department team and self-transfer). Previous research has  
300 identified that clinicians can use incident reporting to protect professional identity,[34,35] and to  
301 deflect blame for incidents.[8 9]

302

303 Explicit references to patient/family involvement and directly addressing patient well-being were  
304 infrequent within reports (22% and 9% respectively). Involvement in the current analysis was

305 typically passive with few details included in reports of how disclosure was addressed, though it is  
306 acknowledged that the majority of data was collected prior to the implementation of a duty of  
307 candour.[26] Despite this, the widespread under-reporting of the levels of harm, which concurs with  
308 previous research,[24] has implications for future disclosure of harm, where duty of candour is  
309 unlikely to be adhered to because incidents were incorrectly recorded as no or low harm. This  
310 discordance between reported and coder interpreted harm are suggestive of reliability and validity  
311 issues of NRLS criteria in the context of patient transitions, or might be a further example of  
312 defensive reporting. Actively engaging patients and their families in reporting safety incidents[32-  
313 35] is one such way of improving involvement. However, our analysis indicates that there is also a  
314 need to consider wider disclosure of incidents, not just those resulting in death or deemed to be of  
315 severe harm, moderate harm, or prolonged psychological harm, as required by the duty of candour  
316 in the UK NHS.[26] The disclosure of lower levels of harm could ensure that patients and/or family  
317 are more involved in their healthcare and may be active participants in their own safety,[36] taking  
318 additional responsibility for their safety.[37] Co-production of incident reports could also facilitate  
319 deeper learning on contributory factors to the types of incidents identified in this study.

320

321 Self-transfer was included as a safety incident following NRLS coding criteria.[36] In some  
322 circumstances it may be debateable as to whether this constitutes a safety incident. It can be argued  
323 that patients are making a preference- and value-based decision to leave hospital. For instance, one  
324 patient self-discharged after seeing his notes and that medical staff did not consider that his  
325 symptoms were indicative of epilepsy, thus making the test redundant, leading to a possible  
326 perception of futility of remaining in hospital. Reported harm in terms of NRLS criteria was  
327 discordant with coder interpreted harm, particularly for pressure ulcers. There was evidence of  
328 over-reporting of no harm, and under-reporting of both low and moderate harm. This may be  
329 explained as a consequence of staff not receiving adequate training on incident reporting. As  
330 suggested previously, it may be that staff who report incidents to deflect blame do not want to draw  
331 attention to the incident, or alternatively they may believe that 'ownership' of the harm does not  
332 belong to them. Regardless, harm has occurred to the patient, and should be reported as such.

333

### 334 **Implications for practice**

335 Incident reporting is based on a safety science approach that requires the identification of incidents  
336 to inform organisational learning and intervention development.[27] Incident reports are often used  
337 to trigger a more in-depth analysis of the reported safety incident, such as through Root Cause  
338 Analysis (RCA), or to identify trends and patterns across all reported incidents. However under-  
339 reporting the level of harm and the use of incident reports as defensive practice, as identified in this

340 study, supports the notion that reporter bias is an inherent feature of incident reporting.[10] These  
341 limitations have important implications for practice. Firstly, under-reporting the level of harm may  
342 influence whether a RCA is conducted or not, and biases around defensive reporting may continue  
343 through into the RCA. This is particularly problematic when RCAs are identified to be at risk of  
344 political hijack amongst other issues.[38] Secondly, there is an increasing focus on the use of  
345 machine learning to derive meaning from large datasets within healthcare, often referred to as 'big  
346 data'. [39] Organisational and especially national incident report systems can generate this big data,  
347 and there is an increasing amount of research exploring the use of machine learning to analyse  
348 incident reports.[40-43] However, machine learning is unable to account for these biases as they are  
349 not yet fully understood and are arguably fluid in nature. Therefore the adage of 'garbage in,  
350 garbage out' that is used in relation to data quality[44] applies to the use of machine learning for  
351 incident reports. Recognising and describing the biases that occur in incident reporting is therefore a  
352 requirement for addressing their causes and tackling the relevant organisational cultures and  
353 structures that result in defensive reporting and under-reporting of harm.

354

355 A further implication for practice is that single incident reports may not be appropriate for patient  
356 transitions due to 'ownership' of the incident representing a grey area. The incident reporter may be  
357 unaware of the precise nature and range of active failures or latent conditions contributing to the  
358 safety incident prior to the patient arriving in their care, including the disposition of the patient prior  
359 to, and after transfer/discharge from their care. A lack of clarity around ownership and  
360 accountability may, in part, account for the infrequent reporting of latent conditions, individual and  
361 organisational learning, including under-reporting of harm in a patient transition context. For  
362 example, a pressure ulcer that originated on another ward, hospital or community may lead to a dis-  
363 ownership of the incident with some staff reporting this as no harm (as the harm did not occur in the  
364 receiver's care), despite the patient actually experiencing harm. As a result of assigning  
365 responsibility for the incident to its origin there is a concomitant reduced likelihood of engaging in  
366 reflective practices and initiating procedures to trigger systems learning. This external attribution of  
367 responsibility is particularly damaging as the transition incident may not have been identified or  
368 reported where the individual's pressure ulcer originated; thus nowhere in the system is the incident  
369 or any harm recorded. Changes to existing training on why and how to complete incident report in  
370 relation to these grey areas could help to improve the quality of incident reports. Incident reporting,  
371 particularly in relation to transitions in care, should therefore not be conducted in isolation. Instead,  
372 the social nature of healthcare delivery needs to be recognised and co-ordinated action should be  
373 taken. A transition incident report that is co-produced with patients/relatives and staff from both the

374 sending and receiving team may help to remove this grey area and improve the quality of incident  
375 reports related to transitions, particularly by reducing bias through triangulation.

376

### 377 **Limitations**

378 The reliability of the data collection process and analysis was augmented by use of a structured data  
379 extraction form and detailed coding manual. The inter-rater reliability of the data extraction form  
380 was more than satisfactory; although subsequent coding of incident reports was predominately  
381 undertaken by one author (DF). Therefore, it is likely there are some subjective interpretations of  
382 the information within reports. Furthermore, omission of some fields of the incident reports as part  
383 of the research governance process may have impacted on the analyses; for example, information  
384 on who compiled the incident report was excluded but may have had relevance, as it has been  
385 reported that seniority influences perception of severity of harm.[45] Incident reports were also  
386 derived from discrete 6-month periods as opposed to continuous months, which prohibited the  
387 impact of any underlying time trend or seasonality (using time series analysis) on frequency and  
388 content of reports to be established. Finally, due to variability in numbers of transitions in each  
389 clinical area and inherent differences in case-mix, any meaningful comparisons between specialisms  
390 in terms of type of incident classification was prohibited.

391

### 392 **Further research**

393 Increased numbers of incident reports, whilst an indicator of a positive safety culture, is an invalid  
394 measure of the safety climate. In order to ensure favourable cultural conditions for safety, system-  
395 level interventions are warranted that convey the value of incident reporting for the benefit of  
396 patients and quality of care, which capitalise on the reflective skills of practitioners. The potential to  
397 make an active error is highest in the sending team, whereas the potential to discover an error is  
398 highest in the receiving team. Therefore, development of patient transition incident reports  
399 constructed by sending and receiving teams (whether inter- or intra-hospital) are warranted for  
400 reducing the prevalence of defensive reporting, and enhancing a sense of joint ownership of  
401 incidents. The latter would benefit from the inclusion of the patient's/relatives' narrative, and there  
402 is a pressing need to develop protocols for co-production of incident reports in collaboration with  
403 patients and relatives. Furthermore, the large under-reporting of harm was a concern. Further  
404 research with staff that under-report levels of harm is needed to identify and address this issue.

405

### 406 **Conclusions**

407 Whilst there were 14 incident classifications identified, nearly 70% of incident reports were in  
408 relation to pressure ulcers, falls, medication and documentation errors, suggesting these are the

409 greatest challenges in providing safe care to patients undergoing a transition in care. Incident  
 410 reports related to patient transitions were primarily used as a defence mechanism to apportion blame  
 411 to other teams or units, or even to patients. The quality of incident reports was sub-optimal for  
 412 individual and organisational learning, and levels of harm appeared to be frequently under-reported.  
 413 This means it is unlikely that clinicians' duty of candour - requiring disclosure of incidents resulting  
 414 in moderate or greater harm, or prolonged psychological harm - is being adhered to. There is a need  
 415 to improve the process of incident reporting to reduce cultural barriers, and to improve the quality  
 416 of incident reports, including the reduction of bias as much as practicable. For incidents relating to  
 417 transitions, a co-produced incident report between the sending and receiving team, including the  
 418 patient and/or relatives, may improve capacity for learning and help to address the issue of bias  
 419 through triangulation.

420

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**Figure and table legends**

- Figure 1: Flowchart diagram of the process used to identify incident reports
- Figure 2: Clustered bar graph of reported and interpreted harm
- Table 1: Cross-tabulation of type of transition and incident classification
- Table 2: Cross-tabulation of incident classifications and active failures with exemplar quotes from incident reports
- Table 3: Cross-tabulation of incident classifications with latent conditions, patient/family involvement, patient well-being and learning



Table 1

		Type of Transition*							
		Inter-unit / dept / team	Out of hospital	Intra-unit / dept / team	Hospital to hospital	Into hospital	Self- transfer	Unknown	Overall
Incident Classification and codes	<b>Pressure ulcer</b>	70	18	2	8	3			101 (36%)
	Pressure sore								
	Skin not intact								
	Moisture lesion								
	Identified after transition								
	<b>Falls</b>	3		29					32 (12%)
	Patient fall								
	Patient fall not reported on transfer								
	<b>Medication</b>	8	18	2		2		1	31 (11%)
	Incorrect dosage								
	Incorrect prescription/error								
	Medication not prescribed								
	Medication delayed								
	Medication incorrectly labelled								
	Missing medication								
	Unclear prescription								
	<b>Documentation</b>	16	9	1	1	2			29 (10%)
	Documentation missing/lost								
	Incomplete documentation								
	Incorrect (other patient) documentation								
	Documentation error								
	Delay in receipt of documentation								
	No transfer documentation								
	<b>Delayed transition</b>	4	10		1				15 (5%)
	Delayed discharge (communication)								
	Delayed discharge (family)								
Delayed discharge (transport)									
Delayed discharge (documentation)									
Delayed discharge (tests)									
<b>Communication</b>	9	4				2		15 (5%)	
No handover taking place									
Sub-optimal handover of information									
Referral not made									
Diagnostic tests not done/delayed									
Treatment not provided / delayed									
<b>Device / equipment</b>	5	4	2	1				12 (4%)	
Device left in situ									

<i>Equipment failure</i>									
<b>Infection control</b>	<b>9</b>		<b>1</b>	<b>1</b>					<b>11 (4%)</b>
<i>Infection control failure</i>									
<i>Infection control risk / protocol breach</i>									
<b>Potentially unsafe transition</b>	<b>9</b>		<b>1</b>	<b>1</b>					<b>11 (4%)</b>
<i>Inadequate monitoring of patient</i>									
<i>Inappropriate transition</i>									
<i>Unsafe handover</i>									
<b>Patient self-transfer</b>		<b>1</b>				<b>9</b>			<b>10 (4%)</b>
<i>Self-discharged without informing staff</i>									
<i>Self-discharged against medical advice</i>									
<b>Staff-related issues</b>	<b>2</b>	<b>1</b>	<b>1</b>						<b>4 (2%)</b>
<i>Sub-optimal levels of staff</i>									
<i>Patient distress arising from staff actions</i>									
<i>Unable to provide safe care / meet patient needs due to staff shortages</i>									
<i>Patient allegations of abuse</i>									
<b>Sub-optimal treatment</b>	<b>3</b>	<b>1</b>							<b>4 (2%)</b>
<i>Breach of discharge protocol</i>									
<i>Treatment error</i>									
<b>Patient injury</b>			<b>2</b>						<b>2 (1%)</b>
<i>Abrasions</i>									
<i>Skin tear</i>									
<b>Patient violence</b>	<b>1</b>								<b>1 (&lt;1%)</b>
<b>Overall</b>	<b>139 (50%)</b>	<b>66 (24%)</b>	<b>41 (15%)</b>	<b>13 (5%)</b>	<b>9 (3%)</b>	<b>9 (3%)</b>	<b>1 (&lt;1%)</b>	<b>278 (100%)</b>	

\*Types of transfer definitions:

- Into hospital - a patient is admitted to a hospital ward from their home or in the community
- Out of hospital - a patient is discharged home (with or without community care), or to a care home
- Inter-unit / department / team - a patient is moved from one ward to another in the same hospital
- Intra-unit / department / team - a patient is moved from a hospital bed to wheelchair or handover between day and night staff
- Hospital to hospital - a patient is moved from one hospital to another, dependent on the perspective of the reporter (receiving or sending the patient)
- Self-transfer - a patient expresses a wish to discharge themselves from hospital (irrespective of whether they followed through with it or not, and staff were informed or not)
- Unknown - it is not clear what type of transfer the patient went through based on the data included in the incident report

Table 2

		N (%)	Active failures	Exemplar quotes
Incident Classification	Pressure ulcer	101 (36%)	<ul style="list-style-type: none"> <li>• Skin bundle documentation inaccurate</li> <li>• Non-adherence/lack of follow-up to treatment of pressure ulcer in skin bundle</li> <li>• No mention of pressure ulcer in transfer documents</li> <li>• No skin assessment undertaken prior to transition</li> <li>• Skin assessment not thoroughly undertaken</li> <li>• Incorrect location of pressure sore in documentation</li> <li>• Pressure sore graded incorrectly in documentation</li> <li>• Tissue viability nurse was not alerted</li> <li>• Pressure ulcer worsening</li> </ul>	<ul style="list-style-type: none"> <li>• Patient transferred [<i>sic</i>] from [<i>name of sending ward</i>] to [<i>name of receiving ward</i>] found to have a stage 1 pressure sore on right buttock however skin bundle stated it was normal</li> <li>• Patient transferred [<i>sic</i>] into the care on our ward and stated on handover that skin was intact and has a grade 2</li> <li>• Patient was handed over to have skin intact but fragile. on skin inspection this was not the case, patient had- Grade 2 spine; Scab to forehead; Grade three to left calf-sloughy; Grade 2 to left calf, scabbed.; Dry cracked skin to both heels and arms; Grade 2 to right forearm,</li> <li>• Nothing has been documented or handed over. No body map already in place and patient has been in hospital for a few days already.</li> <li>• Telephone handover given but no mention of any issues with skin damage</li> </ul>
	Falls	32 (12%)	<ul style="list-style-type: none"> <li>• Inadequate moving and handling</li> <li>• Failure to use equipment available</li> <li>• Failure to check patient understood instructions</li> <li>• Information in patient notes overlooked</li> <li>• Inadequate observation / monitoring of patient</li> <li>• Fall not documented in transfer notes</li> <li>• No medical review after previous falls</li> </ul>	<ul style="list-style-type: none"> <li>• OT and Physiotherapy joint transfer assessment. Sliding transfer from bed to chair. Somehow the wheelchair was pushed away. Patient fell to the floor.</li> <li>• Staff sat at nurses station having handover when heard a loud beng [<i>sic</i>]. when we stood up we saw pt on floor [<i>sic</i>] at doorway to bay 4. Pt had been walking out of bay when she fell but staff had not seen her due to board round screen blocking the view of bay 4 (falls bay).</li> <li>• Bank HCA C reports to me that she was supervising the patient transferring from bed to chair, on route to the bathroom when his legs gave way and he crumbled to his knees.</li> <li>• About to transfer [<i>patient name</i>] from the bed to a wheel chair to sit out. I had placed his slippers on and dropped the bed rail ready for him to move his legs out. I went to the end of the bed to get a zimmer frame, to assist with the transfer, when I turned round Mr C coughed and his legs moved and he turned and rolled out of bed. He landed on the floor next to his bed</li> </ul>
	Medication	31 (11%)	<ul style="list-style-type: none"> <li>• Discharge medication prescription incomplete</li> <li>• Discharged without prescribed medication</li> <li>• Incorrect medication prescribed</li> <li>• Incorrect medication prescribed (other patient)</li> <li>• Medication not administered</li> <li>• Unsigned for controlled medication</li> <li>• Prescription illegible / unclear</li> <li>• Lost medication</li> <li>• Medication labelled incorrectly</li> </ul>	<ul style="list-style-type: none"> <li>• The ward then checked their drug cupboard and it came to light that 1 vial (10 grams) had gone missing so they could not make up the full 30 gram dose</li> <li>• I came onto shift onto [<i>date</i>] and was administering the 8am medications. Noticed on drug chart, 22:00 medications had not been given</li> <li>• Following handover checked prescription which was very unclear.</li> <li>• When discharging patient and gathering TTOS together it was noticed that patients insulin had not been prescribed on TTOS</li> </ul>

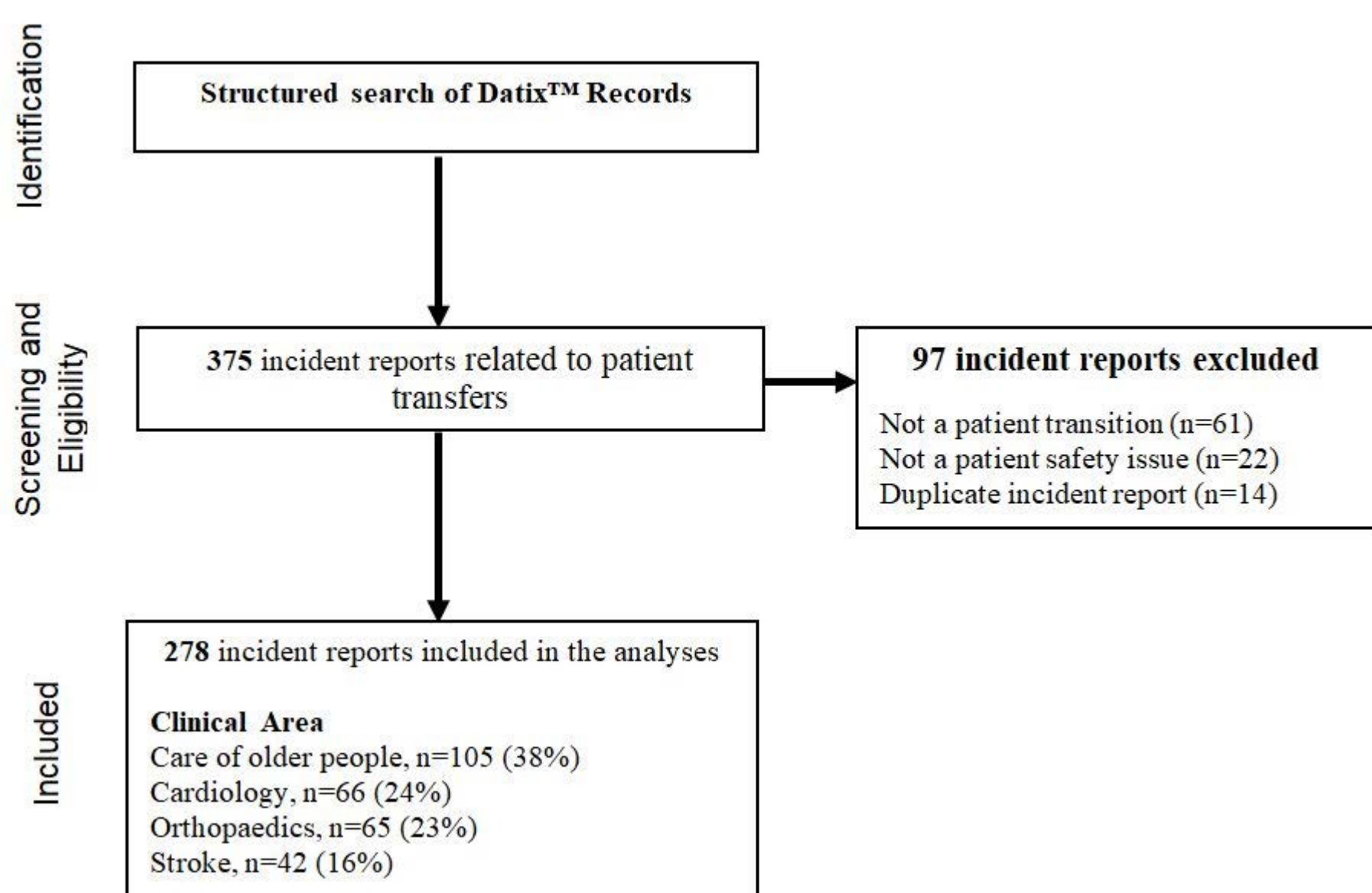
		<ul style="list-style-type: none"> <li>• Incorrect medication dosage in discharge notes</li> <li>• Medication not checked on arrival to ward</li> </ul>	
<b>Documentation</b>	<b>29 (10%)</b>	<ul style="list-style-type: none"> <li>• Patient documentation not signed</li> <li>• Missing information on patient documentation</li> <li>• Required documentation not completed</li> <li>• Lost/misplaced documentation</li> <li>• Incorrect (other patient's) information</li> </ul>	<ul style="list-style-type: none"> <li>• Patient discharged to [name of hospital] this pm. [name of hospital] contacted ward at 1700 stating no notes for the patient had been received</li> <li>• Patient transferred to [name of receiving ward] from [name of sending ward], and found to have another patient's PPM checklist in their notes</li> <li>• When speaking to staff and reading medical notes from [name of sending ward] there has been no documentaion [sic] around the wound</li> <li>• No post-op instructions or post-op care written by staff from previous day when patient returned from theatre</li> </ul>
<b>Delayed transition</b>	<b>15 (5%)</b>	<ul style="list-style-type: none"> <li>• Transport failed to arrive on time</li> <li>• Ambulance personnel not willing to wait</li> <li>• Ambulance arrived with no room for nurse escort</li> <li>• Miscommunication with ambulance service</li> <li>• Miscommunication between staff about availability of bed</li> <li>• Poor communication with family members</li> <li>• Delay in obtaining test results</li> <li>• Take home medications not documented or signed off</li> </ul>	<ul style="list-style-type: none"> <li>• The patient was made ready for transport at 10:00hrs. The patient's transport finally arrived at 16:30hrs.</li> <li>• Patient then turned up unannounced by hospital transport, but bed was unavailable</li> <li>• Patient should have been discharged today all TTO'S and paperwork completed, patient needed pacing check before discharge. We understand the technician was busy and there were emergency's he had to attend to</li> <li>• Patient was ready for collection two ambulance men arrived on the ward at 18:30 the patient had about 8 bags of property. I explained they were not going with her. As I was on the phone arranging for the bags to be collected the ambulance man shouted he had aborted it and I would have to rebook.</li> </ul>
<b>Communication</b>	<b>15 (5%)</b>	<ul style="list-style-type: none"> <li>• Failed to inform at handover that patient required cohorting</li> <li>• Not informed at transfer about deprivation of liberty being in place</li> <li>• No verbal handover took place</li> <li>• No handover of patient history/symptoms#</li> <li>• Not referred for advice / treatment / follow-up</li> <li>• Miscommunication between ward staff</li> </ul>	<ul style="list-style-type: none"> <li>• Stroke Outreach Service (SOS) had been told that her discharge was planned for [date]. No NOTIS referral had been made to SOS on [later date].</li> <li>• Theatre coordinator was not aware of this patient and theatre was not booked.</li> <li>• Routine telephone call to nursing home after discharge- they report that recommendations were not passed over on transfer from nursing staff.</li> <li>• Patient transferred to [name of ward], with an inappropriate handover, was not informed that that the patient needed to be cohorted as gets confused during the night, even though this question was specifically asked.</li> </ul>
<b>Device / equipment</b>	<b>12 (4%)</b>	<ul style="list-style-type: none"> <li>• Sutures not removed</li> <li>• Cannula left in situ</li> <li>• Catheter left in situ</li> <li>• IVF in situ not replaced</li> <li>• IV pump running at incorrect rate</li> </ul>	<ul style="list-style-type: none"> <li>• Patient sent home with venflon still in situ.</li> <li>• On examination it was found that patient had 2 embedded sutures still in place from surgery undertaken in [location of hospital] over 6 weeks ago</li> <li>• Pt found to have catheter in situ, which was full and was drained of 1,500 ml urine.</li> <li>• During bad side hand over, 7.20am (approx) an IV pump with Furosemide alarmed to say it had finished, was not due to finish until 1pm approx, the pump display showed it was running at 24ml/hr. It was prescribed to be running at 1.5ml/hr</li> </ul>
<b>Infection control</b>	<b>11 (4%)</b>	<ul style="list-style-type: none"> <li>• Failure to implement infection control procedures</li> <li>• Poor communication at handover/transfer between staff</li> <li>• Sub-optimal patient isolation</li> </ul>	<ul style="list-style-type: none"> <li>• Patient was being nursed in a closed bay due to Diarrhoea and Vomiting Outbreak. Phone call received from site manager over at the [name of hospital] that patient was to outlie on [name of receiving ward] as identified as medically stable for transfer. Therefore patient was transferred over resulting that other patients on</li> </ul>

		<ul style="list-style-type: none"> <li>• Sub-optimal ward cleaning</li> <li>• MRSA swab test not undertaken</li> </ul>	<p>[name of ward] where put at risk. Another patient transferred into empty bed space.</p> <ul style="list-style-type: none"> <li>• This meant that patient had been exposed to a side room environment, which had previously been occupied by a patient who had been very symptomatic with C Diff, without it being HPV</li> <li>• Patient transferred to [name of ward and date]. It was handed over that this patient was clear of Cdiff. [date] infection control came to ward and explained that patient was not clear of Cdiff and had not been made clear initially.</li> <li>• Pt transferred from [name of ward] to [name of ward] from a side room into a side room with active diarrhoea [sic] and vomiting within the previous 48 hrs , ? why transfer to ward 35 and with these symptoms</li> </ul>
<b>Potentially unsafe transition</b>	<b>11 (4%)</b>	<ul style="list-style-type: none"> <li>• Transition without cardiac monitoring</li> <li>• Non-adherence to treatment protocols</li> <li>• Inaccurate handover of patient history</li> <li>• Failure to take into account well-being of patient</li> <li>• Patient transferred with chest pain</li> </ul>	<ul style="list-style-type: none"> <li>• Staff Nurse from [name of ward] phoned, and advised that they have an admission coming in from [other ward name], but they prefer us admitting the patient while they take one of our patients instead. The patient they want is having on going chest pain, he was on cardiac monitor and was to have Angiogram done the following day at 11:00hrs. The Staff Nurse insisted on having the patient moved to [name of ward] that night, despite the fact that no procedure was scheduled for him during the night.</li> <li>• Patient transferred [sic] from Catheter Lab without monitoring. Patient previously had HR 22, on arrival to Recovery, pre procedure, HR 36. Nil heart monitoring on transfer, additionally, no nurse attended during transfer.</li> <li>• Mr J H was transferred to [name of ward] from [name of ward] on the 03/01/15 , Stoke Rehab, with a 1 - 1 carer and still needing Specialist Stroke Rehab, felt to be an inappropriate transfer and was in fact transferred back on the 05/01/15</li> <li>• Pt handed over as being pleasantly muddled and just in hospital with increased confusion and was fine to go into the main ay. Explained that we had 3 pts already on the ward who required 1-1 care and we had no 1-1 carers. When pt arrived on the ward she immediately started climbing out of bed and becoming very aggressive</li> </ul>
<b>Patient self-transfer</b>	<b>10 (4%)</b>	<ul style="list-style-type: none"> <li>• Delayed diagnostic test</li> <li>• Mental health issues not addressed</li> <li>• Sub-optimal patient observation</li> </ul>	<ul style="list-style-type: none"> <li>• Following a conversation with the medical team in which pt was informed that he was medically fit for discharge pt voiced to the Dr that he had suicidal thoughts and may wish to harm himself if he went home. Shortly after the conversation pt left the ward without informing staff and without any discharge papers or medication. As pt had communicated that he felt suicidal and had left the ward abruptly concerns were felt for his safety.</li> <li>• Patient found reading own notes and taking photos of script on phone. patient very unhappy about what he had read, and started to remove electrodes, tried to diffuse and calm patient to stay in hospital appeared shaky not angry, saying wasting his time in hospital if no one believes these are epileptic seizures, explained that does not mean he isnt having seizures. refused to listen, statement supplied regarding conversion. patient self discharged, without waiting for dr to see.</li> </ul>

<b>Staff-related issues</b>	<b>4 (2%)</b>	<ul style="list-style-type: none"> <li>• Poor communication between transferring &amp; receiving ward staff</li> <li>• Inadequate staffing levels / staff shortages</li> </ul>	<ul style="list-style-type: none"> <li>• Staff transfered [sic] patient to ward and was told by staff nurse that patient was not expected, no hand over given and they did not have mattress for the patient. The receiving staff on the ward was very unwelcoming to the patient stating that she was not supposed to be coming to their ward.</li> <li>• Short staffed with x2 RN's and 1 HCA. bed manager informed an 2nd HCA sent to ward. Lots of confused high falls risk patients. very loud on ward all night with patients using call bell, patients not using call bells and just getting up, lots of patients unwell, short of breath chest pains ect. All staff on ward constantly attending patients. one patient especially noisy shouting out an wake other patients or making it so other patients couldn't sleep at all, which is exacibating [sic] other high falls risks patient to get up and be unsettled.</li> <li>• Short staff- 6 members of staff working [date] Late shift. Discharging many patients- Discharge meds (controlled drugs) not going with the pt as ambulances arrive and want a quick discharge. Spending 35 minutes on the phone booking ambulances which left patients without staff to provide care.</li> </ul>
<b>Sub-optimal treatment</b>	<b>4 (2%)</b>	<ul style="list-style-type: none"> <li>• Temperature probe used incorrectly</li> <li>• Patient on incorrect SLT fluid regimen</li> <li>• BM not taken according to protocol</li> <li>• Patient returned from X-ray without neck collar</li> </ul>	<ul style="list-style-type: none"> <li>• Patient met discharge protocol, oral temperature being 36.3 degrees c. When arriving on the ward, the ward nurse failed to take an accurate reading, due to the fact they did not insert the probe all the way down the ear canal.</li> <li>• Pt had an unstable neck fracture and was sent to x-ray for imaging with neck collar in situ. On pts return to the ward she was found to have been transferred back to the ward without the collar on.</li> <li>• I'm not sure whether the error occurred with [sending ward name] handing over SLT recs or with [name of ward] receiving them but the pt was put on out of date SLT recommendations.</li> <li>• Patient transferred from [name of ward] after having had a lumbar puncture. it was noted that his bm had not been taken since 17.10hrs.</li> </ul>
<b>Patient injury</b>	<b>2 (1%)</b>	<ul style="list-style-type: none"> <li>• Staff failed to notice an injury had occurred during transfer</li> <li>• Sub-optimal use of bed hoist</li> </ul>	<ul style="list-style-type: none"> <li>• Noticed a bump and small bruise to the patient's left eyebrow, and according to the husband, the patient bumped her left eyebrow on the hoist while being transferred from wheelchair to bed, and again according to the husband, it appears that the day staff did not notice what she had done</li> <li>• Whilst patient being transfered [sic] off hoist sling on bed, patient suffered skin tear to left forearm.</li> </ul>
<b>Patient violence</b>	<b>1 &lt;1%)</b>	<ul style="list-style-type: none"> <li>• Information about patient mental health and behavioural history not handed over</li> </ul>	<ul style="list-style-type: none"> <li>• Documented in the nursing notes "can become aggressive and angry very quickly .... this puts others at risk" information that was not handed over prior to transfer.....The patient was verbally aggressive to staff immediately on arrival to [name of ward] she was wandering around the ward threatening to hit staff and other patients</li> </ul>
<b>Overall</b>	<b>278 (100%)</b>		

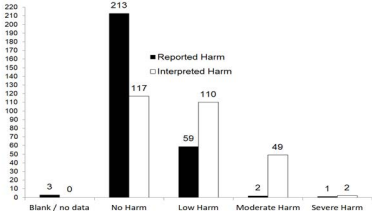
Table 3

			Latent conditions	Patient/family involvement, n (%)	Patient well-being, n (%)	Individual learning, n (%)	Organisational learning, n (%)
		N (%)	n (%)	(%)			
Incident Classification	Pressure ulcer	101 (36%)	1 (1%)	18 (18%)	4 (4%)	1 (1%)	7 (7%)
	Falls	32 (12%)	3 (9%)	4 (13%)	2 (6%)		3 (9%)
	Medication	31 (11%)	5 (16%)	10 (32%)	8 (26%)		3 (10%)
	Documentation	29 (10%)	3 (10%)	6 (21%)		2 (7%)	1 (3%)
	Delayed transition	15 (5%)	6 (40%)	6 (40%)	2 (13%)		1 (7%)
	Communication	15 (5%)	3 (20%)	2 (13%)	2 (13%)		1 (7%)
	Device / equipment	12 (4%)	1 (8%)	2 (16%)	1 (8%)		1 (8%)
	Infection control	11 (4%)	4 (36%)			1 (9%)	
	Potentially unsafe transition	11 (4%)	3 (28%)	1 (9%)		2 (18%)	
	Patient self-transfer	10 (4%)	1 (10%)	7 (70%)	2 (20%)		
	Staff-related issues	4 (2%)	3 (75%)	3 (75%)	3 (75%)		2 (50%)
	Incorrect treatment	4 (2%)					
	Patient injury	2 (1%)		1 (50%)			
	Patient violence	1 (<1%)	1 (100%)	1 (100%)		1 (100%)	
Overall		278 (100%)	33 (12%)	61 (22%)	24 (9%)	7 (3%)	19 (7%)





Number of Incident Reports



## Online Appendix 1: Data extraction form

ITEM	RESPONSE
<b>Incident number</b>	
<b>Coder initials</b>	
<b>Eligible</b> <i>If no, do not complete rest of form and exclude</i>	Yes No Possible (requires second review)
<b>Type of transfer</b>	Into hospital Out of hospital Inter-unit / department / team Intra-unit / department / team Hospital to hospital Self-transfer Unknown Other [please describe]:
<b>Reason for transfer</b>	
<b>Incident classification</b>	
<b>Active failure(s)</b>	
<b>Latent condition(s)</b>	
<b>Was responsibility for the incident identified? If yes, provide details</b>	
<b>Staff actions taken as result of incident</b> <i>Include brief description</i>	Patient-facing actions (treatment) Documentation Communication with other staff Communication with patient / family Other [please describe]:
<b>Role of reporter in incident</b>	
<b>Patient / family involvement</b>	
<b>Patient wellbeing</b>	
<b>Evidence of individual learning</b>	
<b>Evidence of organisational / systems learning</b>	
<b>Does level of harm match the incident description? If no, explain</b>	
<b>Reflections on incident</b> <i>(sentence or short paragraph)</i>	
<b>Does this record require additional review?</b> <i>This field is for primary reviewer only</i>	

## Online Appendix 2: Coding Manual

The purpose of this coding manual is to provide detailed instructions on how to code staff incident reports relating to handover, transfer and discharge. Reviewers should avoid making assumptions about the incident, and use only the data explicitly reported in the incident report (otherwise code as none reported).

### Item-by-item instructions

#### Incident number

The unique ID assigned to each incident.

#### Coder initials

Initials of the person coding the incident.

#### Eligible

An eligible incident is one that explicitly relates to any type of care process (collect, assess, plan, supplement or follow-up/monitor or evaluation - <https://jcnp.net/patient-care-process/>) as part of a patient transfer (completed or planned), defined as the movement of a patient from one location to another. Self-transfer in the form of self-discharge were also eligible for inclusion.

#### Type of transfer

There are numerous types of transfer that a patient can go through:

Type of transfer	Example / description
<b>Into hospital</b>	A patient is admitted to a hospital ward from their home or in the community
<b>Out of hospital</b>	A patient is discharged home (with or without community care), or to a care home
<b>Inter-unit / department / team</b>	A patient is moved from one ward to another in the same hospital
<b>Intra-unit / department / team</b>	A patient is moved from a hospital bed to wheelchair or handover between day and night staff
<b>Hospital to hospital</b>	A patient is moved from one hospital to another, it is dependent on the perspective of the reporter (receiving or sending the patient)
<b>Self-transfer</b>	A patient expresses a wish to discharge themselves from hospital (irrespective of whether they followed through with it or not), whether or not staff were informed
<b>Unknown</b>	Where it is not clear what type of transfer the patient went through based on the data included in the incident report
<b>Other</b>	Any other type of transfer not listed above

#### Reason for transfer

This code attempts to determine whether a reason for the transfer was identified within the incident report. It is likely that the reason for the initial transfer is not identified within the incident report unless it directly contributes to the incident. Where the reason is not identified, it should be recorded as 'unknown'.

### **Incident classification**

This code is the type of incident that occurred, such as a patient fall, medication error, pressure sore, delayed discharge. All incidents should receive a single classification, which is the primary ‘reason’ for the incident being reported. Note that this may not match the incident type provided in the incident report system, and should instead be coded using details provided in the incident.

### **Active failure(s)**

According to the Swiss-Cheese model of safety, *Active failures* are the unsafe acts committed by people who are in direct contact with the patient or system. They take a variety of forms: slips, lapses, fumbles, mistakes, and procedural violations. Failures have a direct and usually short-lived impact on the integrity of the defences.

### **Latent condition(s)**

According to the Swiss-Cheese model of safety, *Latent conditions* are the inevitable “resident pathogens” within the system. They arise from decisions made by designers, builders, procedure writers, and top level management. Latent conditions have two kinds of adverse effect: they can translate into error provoking conditions within the local workplace (for example, time pressure, understaffing, inadequate equipment, fatigue, and inexperience) and they can create long-lasting holes or weaknesses in the defences (untrustworthy alarms and indicators, unworkable procedures, design and construction deficiencies, etc.).

### **Was responsibility for the incident identified?**

In some cases, the incident reporter will attribute responsibility or even blame for the incident. This may be acknowledging that they themselves had made a mistake, another healthcare professional made a mistake or even the patient making a mistake. If responsibility is attributed, it is important to code who it was attributed to in this field, and any other relevant information not coded elsewhere, such as in the active failures or latent conditions field.

This field is different to active failures and latent conditions; an active failure could be written in a passive tense without identifying responsibility, such as ‘patient not on correct mattress’. Whereas in some incidents responsibility may be attributed to the active failure, ‘healthcare assistant did not place patient on the correct mattress’. This does not just apply to active failures, for example a latent condition (staffing issues) may have responsibility attributed at an organisational level, or not at all (or even to an individual).

### **Staff actions taken as a result of the incident**

There are different types of actions that staff took as a result of an incident. These broadly include patient-facing actions that relate to treatment and immediate care of the patient (e.g. taking patient observations, applying a care plan, dressing a wound), documentation (reporting the incident cannot be classed as documentation), communication with other staff (e.g. informing others of the incident, requesting further information or actions to be taken), and communication with patient / family (e.g. apologising, explaining the incident, requesting information, providing education).

### **Role of reporter in incident**

This is about what the reporter’s role was in the incident. Examples may include directly witnessing the incident, identifying an incident had occurred, causing the incident or having to deal with the outcomes of the incident.

**Patient or family/carer involvement**

This code is attempting to understand how the patient and/or family were involved in the incident beyond being the 'recipient'. Types of involvement may include making staff aware of the incident, providing information about the incident, contributing to the incident through their own (non)actions. Reports with no patient or family involvement should be coded as 'none', on the assumption that only information explicitly stated in the incident report is coded. It is possible for some repetition with the active failures code, and this is acceptable.

**Patient wellbeing**

The duty of candour legally requires the health service to inform and apologise to patients if there have been mistakes in their care that lead to significant harm, though there is no such duty of candour for lower levels of harm. The purpose of this coding category is to identify how the patient's wellbeing has been taken into account as a result of the incident, including providing reassurance, apologising, demonstrating dignity or taking into account patient feelings. Note that there may be some crossover with the staff actions coding category. The purpose of having this as a discreet category is to identify where patient wellbeing has not been reported to be taken into account.

**Evidence of individual learning**

Evidence may exist in the form of reflections by the reporter about what they may do differently in the future. It is possible for there to be no evidence of individual learning, and reporting the incident is not evidence of critical reflection. If evidence is identified then further details should be provided within the response.

**Evidence of organisational / systems learning**

Evidence may exist in the form new barriers, defences or safeguards established to prevent a similar incident occurring in the future, or of attempting to understand the cause of the incident, such as through a team meeting. It is possible for there to be no evidence of organisational / systems learning, and reporting the incident is not evidence of this. If evidence is identified then further details should be provided within the response. Look out for mention of a RCA – this should be coded as evidence of organisational / systems learning.

**Does level of harm match the incident description?**

This code is trying to determine whether the level of harm reported is appropriate. It can be difficult to establish whether the harm is the result of the incident when a patient is being transferred. In these cases, it should be assumed that harm has occurred where the incident either caused new harm, or exacerbated existing harm. For example, a patient with a grade 2 pressure ulcer that had not been diagnosed or documented before the transfer would have exacerbated the harm. In rare cases, the level of harm may not be reported. The reviewer should assess the reasons for this on a case-by-case basis using the NHS criteria for reporting of harm (National Reporting and Learning System (NRLS)):

***No harm***

***Low:*** Any unexpected or unintended incident that required extra observation or minor treatment and caused minimal harm to one or more persons.

***Moderate:*** Any unexpected or unintended incident that resulted in further treatment, possible surgical intervention, cancelling of treatment, or transfer to another area, and which caused short-term harm to one or more persons.

***Severe:** Any unexpected or unintended incident that caused permanent or long-term harm to one or more persons.*

***Death:** Any unexpected or unintended event that caused the death of one or more persons.*

**Reflections on incident**

These are the reviewer's own reflections on the incident, and are intended to be no more than a sentence or short paragraph summarising any key thoughts/views or reactions to the incident report. Reflections are intended to inform discussions amongst data analysts.

### Online Appendix 3: Inter-rater reliability

**Table 1: Inter-rater reliability between [author 1] (20% of incidents) and [authors 2,3, 4 and 5; initials redacted for review] (5% incidents).**

Variable	Percent agreement (≥75% deemed acceptable)	Scott's Pi (≥0.6 deemed acceptable)
Eligibility	<b>91%</b>	<b>0.813</b>
Type of transfer	<b>76%</b>	0.517
Reason for transfer	45%	-0.103
Hazard / nature of incident	<b>83%</b>	<b>0.655</b>
Active failure	48%	-0.034
Latent condition	<b>88%</b>	<b>0.759</b>
Who was involved	62%	0.241
Role of staff	43%	-0.138
Role of patient / family	<b>84%</b>	<b>0.690</b>
Level of harm	<b>81%</b>	<b>0.621</b>
Actions taken	<b>81%</b>	<b>0.621</b>
Reflections	48%	-0.034

**Table 2: Inclusion/exclusion agreement between [author 1] and [author 7; initials redacted for review]**

Case #	DF	JS	Notes
	Eligible (yes / no)	Eligible (yes / no)	
6	Yes	Yes	
8	No	Yes	Agreed to exclude
75	No	No	Unwitnessed fall
94	Yes	Yes	
102	Yes	Yes	
125	Yes	Yes	
133	Yes	Yes	
134	Yes	Yes	
138	Yes	Yes	
139	Yes	Yes	
163	Yes	Yes	
184	Yes	Yes	
190	Yes	Yes	
207	Yes	Yes	
251	Yes	Yes	
259	Yes	Yes	
282	Yes	Yes	
326	Yes	Yes	
358	Yes	Yes	
366	Yes	Yes	

#### Online appendix 4: Reasons for ineligibility of incident reports

#	Case	Notes	JS
1.	2	Not related to a patient transfer – patient fall with no involvement of staff	OUT
2.	8	Staff complaint about a relative's behaviour	OUT
3.	10	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
4.	11	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
5.	14	Not related to a patient transfer - lost property of patient (NOT SAFETY INCIDENT)	OUT
6.	17	Not related to a patient transfer - patient handover sheet found in male toilet	OUT
7.	21	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
8.	27	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
9.	38	Patient documentation found in disabled parking bays	OUT
10.	39	Not related to a patient transfer –patient found in distress	
11.	42	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
12.	55	Not related to a patient transfer – delayed review by registrar/senior medic	
13.	65	Not related to a patient transfer – unwitnessed fall	
14.	66	Staff complaint about a member of staff	OUT
15.	75	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
16.	79	Staff report of inadequate staffing levels – no patient-related transfer incident reported	OUT
17.	84	Not related to a patient transfer - inappropriate patient behaviour	OUT
18.	85	Not related to a patient transfer - Doctor who processed a sample was not BGA (blood gas analysis trained) and processed under the log in of another Dr	
19.	86	Not related to a patient transfer – unwitnessed fall	
20.	87	Staff report of inadequate staffing levels – no patient-related transfer incident reported	
21.	88	Staff report of inadequate staffing levels – no patient-related transfer incident reported	
22.	97	Not related to a patient transfer - no patient-related transfer incident reported	
23.	99	Not related to a patient transfer – unwitnessed fall	
24.	103	Patient deceased	
25.	113	Patient deceased	
26.	114	Patient deceased	
27.	115	Duplicate of case 229	
28.	116	Duplicate of case 231	
29.	117	Duplicate of case 235	
30.	122	Duplicate of case 317	
31.	127	Staff report of concerns about delays in booking ambulances – no patient-related transfer incident reported	
32.	128	Staff report of concerns about delays in booking ambulances – no patient-related transfer incident reported	
33.	129	Duplicate of case 372	
34.	132	Staff report of inadequate staffing levels – no patient-related transfer incident reported	OUT
35.	149	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
36.	150	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
37.	152	Staff concern about a staff member's level of expertise	OUT
38.	153	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
39.	161	Staff complaint about a relative's behaviour	OUT
40.	166	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
41.	170	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
42.	171	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
43.	173	Not related to patient transfer – staff injury	
44.	174	Staff complaint about a relative's behaviour	OUT
45.	185	Staff report of inadequate staffing levels – no patient-related transfer incident reported	OUT
46.	187	Duplicate of case 120	
47.	191	Staff report of inadequate staffing levels – no patient-related transfer incident reported	OUT
48.	194	Duplicate of case 193	OUT
49.	196	Repeat of case 121	
50.	200	Not related to a patient transfer – patient was out of hospital	
51.	204	Duplicate of case 108	
52.	207	Not related to a patient transfer – unwitnessed fall	



53	208	Duplicate of case 110	
54	210	Repeat of case 111	
55	213	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
56	215	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
57	218	Staff report of inadequate staffing levels – no patient-related transfer incident reported	OUT
58	227	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
59	234	Not related to a patient transfer – unwitnessed fall, patient found on floor	
60	236	Staff report of inadequate staffing levels – no patient-related transfer incident reported	
61	241	Duplicate of case 119	
62	243	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
63	244	Not related to a patient transfer – unwitnessed fall, patient found on floor	
64	249	Not related to a patient transfer – unwitnessed fall, patient found on floor	
65	251	Staff incident (injury to staff member) – NO POTENTIAL FOR PATIENT HARM	
66	253	Not related to a patient transfer – unwitnessed fall, patient found on floor	
67	256	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
68	258	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
69	261	Not related to a patient transfer – unwitnessed fall, patient found on floor	
70	267	Not related to a patient transfer – unwitnessed fall, patient found on floor	
71	268	Not related to a patient transfer - Inappropriate patient behaviour	OUT
72	269	Staff report of inadequate staffing levels – no patient-related transfer incident reported	OUT
73	271	DATA PROTECTION ISSUE NOT A SAFETY ISSUE	
74	280	Not related to a patient transfer – unwitnessed fall, patient found on floor	
75	285	Staffing issue – scheduling problem with staff member	OUT
76	287	Staffing issue – refusal to help cover nurse re childcare issues	OUT
77	291	Not related to a patient transfer – delayed review by registrar/senior medic	
78	292	Not related to a patient transfer – Patient documentation found out of place	
79	300	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
80	303	Duplicate of case 124	
81	305	Inappropriate patient behaviour – left ward with friend for cigarette – suspected smoking cannabis. Injury to security guard	OUT
82	306	Staff report of inadequate staffing levels – no patient-related transfer incident reported	
83	315	Staff report of inadequate staffing levels – no patient-related transfer incident reported	OUT
84	318	Not related to patient transfer – patient hidden and distressed	OUT
85	324	Staff report of inadequate staffing levels – no patient-related transfer incident reported	OUT
86	325	DATA PROTECTION ISSUE NOT A SAFETY ISSUE	OUT
87	327	Patient aggression – not transfer related	OUT
88	329	Administration issue – not related to patient transfer	
89	330	Staffing level concerns –NOT A PATIENT TRANSFER	OUT
90	331	Cleaning (HPV) of ward delayed – NOT A PATIENT TRANSFER	OUT
91	332	Bed not cleaned as per trust policy – NOT A PATIENT TRANSFER	OUT
92	341	Staff complaint about a member of staff	
93	350	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT
94	354	Staff incident (injury to staff member) – NO POTENTIAL FOR PATIENT HARM	OUT
95	363	Duplicate of case 125	
96	371	Not related to a patient transfer – unwitnessed fall	OUT
97	374	Not related to a patient transfer – unwitnessed fall, patient found on floor	OUT

Online appendix 5: Cross tabulations of clinical area and incident classification

		Clinical Area				
		Older people	Cardiology	Orthopaedics	Stroke	Overall
Incident Classification	Pressure ulcer	44	22	24	11	101
	Falls	9	6	7	10	32
	Medication	12	9	7	3	31
	Documentation	6	8	9	6	29
	Delayed Transition	7	4	1	3	15
	Communication	2	2	6	5	15
	Device / equipment	8	2	2		12
	Infection control	4	3	1	3	11
	Potentially unsafe transition	6	3	2		11
	Patient self-transition		7	3		10
	Sub-optimal treatment			3	1	4
	Staff-related issues	4				4
	Patient injury	2				2
	Patient violence	1				1
Overall		105	66	65	42	278

Online appendix 6: Cross tabulations of type of transition and clinical area

		Type of Transition							
Clinical Area		Inter-unit/dept/team	Out of hospital	Intra-unit/dept/team	Hospital to hospital	Into hospital	Self-transfer	Unknown	Overall
	Older people	55	34	12	1	2			104
	Cardiology	33	13	8	1	5	6		66
	Orthopaedics	32	12	10	5	2	3	1	65
	Stroke	19	7	11	6				43
	Overall	139	66	41	13	9	9	1	278